

CLAIMS

1. A print control system adapted to control a digital printer having a first machine-readable ink of a first colour and a second ink that is not machine readable at the same wavelength as said first ink and that is of substantially the same colour, said system being adapted to control said printer to print upon a document in said first ink a position-determining pattern readable by a digital pen to enable said pen to acquire data to enable a position of said pen in said pattern to be determined, and to print human discernable content that is not read by said pen superposed with said pattern using said second ink and not said first ink.
2. A print control system according to claim 1 wherein said first colour is black.
3. A print control system according to claim 1 or claim 2 which is configured to allocate said first ink to a pattern-allocated colour channel and to use said pattern-allocated colour channel exclusively for printing pattern when printing a document that has both content and pattern.
4. A control system according to any preceding claim adapted to cause a printer to print content of documents which do not have pattern using said first ink.
5. A control system according to any preceding claim adapted to cause a printer to print a document which has both pattern and content using said second ink to print content on areas of said document which also have pattern, and said first ink to print content on areas of said document which do not have pattern.

6. A control system according to any preceding claim, wherein a first look-up table is provided to enable a conversion of pixel colour values from RGB to separate ink colour values in a colour separation process, and wherein the first look-up table is adapted to translate RGB colour data input for content into colour planes that do not include the colour plane of the machine-readable ink.

7. A control system according to claim 6 when dependent on claim 3, wherein said first look up table is adapted to translate pattern data into a single colour plane that is allocated to said pattern-allocated colour channel.

8. A control system according to claim 6 or claim 7, wherein the system has a second look-up table which is adapted to enable a conversion of pixel colours from RGB to separate ink colour values in a colour separation process, and wherein the second look-up table is adapted to translate RGB colour data input for content into colour planes that do include a colour plane having the colour plane of the machine-readable ink, the control system being arranged to use the first look-up table when controlling the printing of documents, or regions of documents, which have both content and pattern and to use the second look-up table when controlling the printing of documents, or regions of documents, which have content but no pattern.

9. A control system according to claim 6, claim 7 or claim 8 wherein for a printer having CMY inks the relative amounts of C ink, M ink, and Y ink determined by the look up tables, to be used for at least some RGB colours are different, for the same RGB colour, in the first and second look-up tables.

10. A control system according to any preceding claim adapted for use with a printer having a first black ink, K1, in a first printer colour channel, and a second black ink, K2, in a second printer colour channel, K2 comprising said machine-readable ink and the second colour channel
5 comprising said pattern-allocated channel, and K1 comprising a black ink that is not readable by said pen; said system being adapted when controlling printing of a document having both content and pattern to cause the printer to print at least content superposed upon pattern using K1 and not K2, and to print pattern using K2.
- 10
11. A control system according to any preceding claim adapted for use with a printer having at least five colour channels, including CMYK1K2.
12. A control system according to any preceding claim adapted to route
15 data representative of content colour to (i) a colour separation process, and to (ii) a half-toning process, and to (iii) a masking process, and where said system is adapted to route data representation of pattern so as to by-pass a half-toning process.
- 20 13. A control system according to claim 12 adapted to route data representative of pattern so as to by-pass a masking process.
14. A control system according to claim 12 or claim 13 adapted to route data representative of content through a linearisation process, and adapted
25 to route data representation of pattern so as to by-pass said linearisation process.
15. A control system according to any preceding claim comprising at least one of:-
- 30 (i) a printer driver;
(ii) a raster image processor.

16. A print control system adapted to control a digital printer having a first machine-readable ink and a second ink, or inks, that is/are not machine-readable at the same wavelength as said first ink, said system
5 being configured to cause said printer to print documents having both:-

- (i) machine-readable pattern adapted to enable a digital pen to acquire data to enable its position in said pattern to be determined, and
- (ii) human-discernable content that is not read by said pen in use,
10 said system being configured to cause said printer to print said pattern with said first ink, and to print said document with content which is superposed with pattern using said second ink or inks, and to print at least some content that is not superposed with said pattern using said first ink.

15

17. A print control system according to claim 16 wherein said first ink comprises a black ink and wherein said second ink or inks comprise an ink set capable of full colour printing, black content that is superposed upon said pattern being printed using CMY, and black content that is not
20 superposed with said pattern, and said pattern, being printed using said first black ink.

18. A print control system according to claim 16 or claim 17 adapted to route data representative of content colour to (i) a colour separation
25 process, and to (ii) a half-toning process, and to (iii) a masking process, and where said system is adapted to route data representation of pattern so as to by-pass a half-toning process.

19. A print control system according to claim 16, or claim 17 or claim
30 18 adapted to route data representative of pattern so as to by-pass a masking process.

20. A print control system according to claim 16 or claim 17 or claim 18 or claim 19 adapted to route data representative of content through a linearisation process, and adapted to route data representation of pattern so as to by-pass said linearisation process.

21. A print control system adapted to control a digital printer having a first machine-readable ink and a second ink, or inks, that is/are not machine-readable at the same wavelength as said first ink, said system being configured to cause said printer to print documents having both (i) machine-readable pattern adapted to enable a digital pen to acquire data to enable its position in said pattern to be determined, and (ii) human-discernable content that is not read by said pen in use, said system being adapted to route data representative of content colour to (i) a colour separation process, and to (ii) a half-toning process, and to (iii) a masking process, and where said system is adapted to route data representation of pattern so as to by-pass a half-toning process.

22. A control system according to claim 21 adapted to route data representative of pattern so as to by-pass a masking process.

23. A control system according to claim 21 or claim 22 adapted to route data representative of content through a linearisation process, and adapted to route data representation of pattern so as to by-pass said linearisation process.

24. A method of printing documents having printed thereupon both:
(i) machine-readable position-determining pattern adapted to enable a machine reader to determine its position in a pattern space, and
(ii) human-discernable content adapted not to be read by said machine reader;

the method comprising digitally printing the content and pattern onto the document using the same digital printer, the printer having a first ink which is not machine-readable at a particular wavelength of electromagnetic radiation and a second ink that is machine-readable at the said particular wavelength , and printing the content with the first ink and not the second ink, at least where said content overlies said pattern, and printing the pattern using the second ink; and wherein content is printed in ink of substantially the same colour as said pattern.

10

25. A method according to claim 24 wherein said colour is black.

26. A method of printing documents having printed thereupon both:

- 15 (i) machine-readable position-determining pattern adapted to enable a machine reader to determine its position in a pattern space, and
(ii) human-discernable content adapted not to be read by said machine reader;

the method comprising digitally printing the content and pattern onto the document using the same digital printer, the printer having a first ink which is not machine-readable at a particular wavelength of electromagnetic radiation and a second ink that is machine-readable at the said particular wavelength , and printing the content with the first ink and not the second ink, at least where said content overlies said pattern, and printing the pattern using the second ink; wherein data representative of content is half-toned, and wherein data representation of pattern bypasses a half-toning process.

27. A method according to claim 26 wherein data representative of content is operated upon by a masking process, and data representation of pattern bypasses a masking process.

30

28. A method of printing documents having printed thereupon both:
(i) machine-readable position-determining pattern adapted to enable
a machine reader to determine its position in a pattern space, and
(ii) human-discernable content adapted not to be read by said
5 machine reader;

the method comprising digitally printing the content and pattern onto the
document using the same digital printer, the printer having a first ink which
is not machine-readable at a particular wavelength of electromagnetic
radiation and a second ink that is machine-readable at the said particular
10 wavelength , and printing the content with the first ink and not the second
ink, at least where said content overlies said pattern, and printing the
pattern using the second ink, wherein content that is not superposed with
pattern is printed with said second ink.

- 15 29. A method of printing documents having printed thereupon both:
(i) machine-readable position-determining pattern adapted to enable
a machine reader to determine its position in a pattern space, and
(ii) human-discernable content adapted not to be read by said
machine reader;

20 the method comprising digitally printing the content and pattern onto the
document using the same digital printer, the printer having a first ink which
is not machine-readable at a particular wavelength of electromagnetic
radiation and a second ink that is machine-readable at the said particular
wavelength , and printing the content with the first ink and not the second
25 ink, at least where said content overlies said pattern, and printing the
pattern using the second ink;

the method further comprising using a printing system that has a plurality
of colour translation look-up tables to translate computer electronic colours
to ink set colour values, one of said tables translating electronic colours to
20 ink set colour values for content to be printed not using an ink set that has
said second ink colour.

30. A method according to any one of claims 24 to 28 comprising using a printing system that has a plurality of colour translation look-up tables to translate computer electronic colours to ink set colour values, one of said
5 tables translating electronic colours to ink set colour values for content to be printed not using an ink set that has said second ink colour.

31. A method of using a computer processor linked to a printer comprising:
10 (i) at a first time using the computer processor to print documents, or parts of documents, that have both (a) machine-readable position-determining pattern and also (b) human discernable, but not machine-readable, content, by printing the pattern using an ink that is machine-readable at a specific wavelength and the content using
15 an ink or inks that are not machine-readable at said specific wavelength, the printer having both inks; and
(ii) at a second time using the computer processor to print documents, or part of documents, that have no pattern using said ink that is machine-readable as at least one of the ink(s) used to print the
20 content.

32. A printer having a black ink allocated to a colour channel, said black ink absorbing at an infra-red wavelength, and wherein the printer is controlled using the method of any one of claims 24 to 31 when printing a
25 document having both machine-readable position-detecting pattern and non-machine-readable human-discernable content to print the pattern using the black ink and at least some content not using the black ink.

33. A method of printing a printed article having both a human
30 discernable content visible at a visible wavelength of light, and a machine-determinable position determining pattern detectable at a non-visible

wavelength of light, the method comprising printing the pattern and the human discernable content in a single printing operation substantially simultaneously using a printer that has both a first ink that is absorptive at said non-visible wavelength, and that is used to print the pattern, and a
5 second ink that is not substantially absorptive at said non-visible wavelength, but is visible at said visible light wavelength, and which second ink is used to print at least such said content as is superposed with pattern.

10 34. A method according to claim 33 wherein all content is printed using ink that is not said first ink.

35. A method according to claim 33 or claim 34 wherein the pattern is printed in black using a first ink that is black in visible wavelengths, and
15 wherein the human discernable content is printed in black using a second ink comprising an ink that is black in visible wavelengths.

36. A method according to claim 31 in which a selection is made between a first print option using inks in a first way to print a document, or
20 part of a document, that has no machine readable pattern, and a second print option using inks in a second, different, way to print documents, or part of documents, that have both machine readable pattern and human discernable content, the selection being made by one of: (i) the computer user; or (ii) automatically without the computer user having to perform a
25 positive act.

37. A method according to any preceding method claim practised in an office computer network provided in a building having a plurality of user computer stations and at least one printer linked to the network, and a
30 computer processor having pattern allocation capabilities, the method further comprising a user in the building using their computer station to

access a pattern and to select or create content and to cause pattern and content to be sent to the printer and to cause the pattern and content to be printed on the document together, thereby enabling a user to select or create and print-out substantially in real time documents having both
5 pattern and content.

38. A method of printing a printed article according to any preceding method claim in which the article has both a human-discernable black-coloured content, and a machine-determinable position determining pattern
10 printed in black ink and detectable at a non-visible wavelength, optionally infra-red, the method comprising printing the content and pattern using a printer that has two black inks: a first black ink that is used to print the pattern and which absorbs radiation at said non-visible wavelength; and a
15 second black ink that does not significantly absorb radiation at said non-visible wavelength.

39. A method according to claim 38 comprising taking a printer having five or more colour channels and providing the first and second black inks to two of the channels respectively, and three different colours to three of
20 the other channels respectively.

40. A method of printing both machine-readable position-determining pattern in a specific colour, optionally black, ink and human-discernable content in said specific colour ink by using a multi-colour channel printer
25 using a first specific colour, optionally, black, ink in one channel that is absorptive at a non-visible wavelength and using a second said specific colour, optionally, black ink in a second channel that is not substantially absorptive at said non-visible wavelength.

30 41. A method according to any preceding method claim comprising altering software on a printer driver, or installing new printer driver

software, to print pattern exclusively from one colour channel, or a limited selected number of colour channels, of the printer, and to print content not using that channel (or channels), at least in areas where pattern is present.

5 42. A method according to any preceding method claim comprising changing at least one ink in a printer so that the inks in the printer include at least one ink that absorbs at a non-visible wavelength and at least one ink of the same colour that does not absorb significantly at said non-visible wavelength.

10

43. In a hexichrome printer adapted to print six colours, a method of printing according to any preceding method claim, comprising having said first ink be of a first colour and be of a first kind in a first colour channel to print said machine-readable position-determining pattern, and using at least
15 four other colour channels to print at least some of said human-discernable content in full colour using three complementary colour inks and a second ink also of said first colour, the inks used to print content that is superposed with pattern being of a second kind; ink of the first kind absorbing at an infra-red wavelength, and ink of said second kind not
20 absorbing at said infra-red wavelength significantly.

44. A method of printing according to claim 43 wherein the first ink and said second ink also of said first colour comprise two different black inks.

25 45. The use of an ink set comprising a first ink of a first colour which absorbs at a non-visible wavelength, and a second ink of said first colour which does not significantly absorb at said non-visible wavelength in printing both a machine-readable position-determining pattern and human-discernable content upon an article in a single printing operation using a
30 single printer.

46. A local area network comprising a plurality of computer terminals networked to at least one printer, the printer having a first ink channel that has ink of a first colour that does not absorb at a selected, preferably non-visible, wavelength and a second ink channel that has ink also of said first colour that absorbs at said selected wavelength, and wherein the computer terminals are adapted to send a request for a document to be printed to one or more printers on said network, and said printer(s) are adapted to receive that request and to print a document pursuant thereto; said computers being adapted to generate a request for said document to be printed including instructions adapted to cause said printer to print machine-readable position-determining pattern on said document using said second ink channel, and also including instructions adapted to cause human-discernable content to be printed on said document using said first ink channel, and said printer(s) being adapted to be responsive to receipt of such instructions to print a document having said pattern and said content, and wherein said computer terminals are also adapted to send instructions to the printer(s) which cause the printers to print human-discernable content on documents that have no pattern using ink from said second channel.

20

47. A method of printing an article with a position-determining pattern that is machine-readable at a selected, optionally non-visible, wavelength and with human-discernable content, the method comprising taking a RGB version of an image from a computer and isolating the pattern in its own colour plane, optionally during a colour separation process, content being printed with other available colour planes not including said pattern colour plane.

48. A method according to claim 47 in which content colour plane data undergoes a half-toning and masking operation in order to determine what

30

content, if any, is printed at each pixel of the printing operation, and wherein pattern colour plane data bypasses the half-toning operation.

49. A method of printing on demand a page or other article with both a machine-readable position-determining pattern readable at a specific, optionally non-visible, wavelength and also human-discernable content using a single digital printer responsive to a print command from a user's processor, the method comprising having content data and pattern data and processing the content data differently from the pattern data during data processing performed to print the document.

50. A method of printing according to claim 49 comprising using a single digital printer responsive to a print command from a user's processor, and the method comprising treating the pattern as text content in a printer driver, and printing the pattern using exclusively one ink that is readable by a machine at said non-visible wavelength, or exclusively using a plurality of inks that are readable at said non-visible wavelength, and printing the content, at least that content which is superposed with said pattern, using exclusively an ink, or inks, that are not machine-readable at said non-visible wavelength.

51. A method of reducing problems experienced by an infra-red digital pen in determining a position in a dot pattern, the pen having an infra-red sensor and a camera adapted to recognise a position in a dot position-determining pattern printed in ink that is detectable on a page or sheet at an infra-red wavelength, the method comprising using a digital printer to print the page or sheet on demand from a user in a single print operation, the dot pattern printed with infra-red absorbing black ink, and human-discernable content, at least in the vicinity of said pattern, printed using black ink that is not infra-red absorbing significantly as observed by said pen.

52. The use of an ink set in a digital printer to print out both machine-readable pattern adapted to enable a digital pen to determine its position in the pattern in a first ink, and to print human-discernable content in a second ink, the first ink comprising a black pigment based ink which absorbs at an infra-red wavelength and the second ink comprises a black dye based ink which does not absorb significantly at said infra-red wavelength.

53. A computer programme product which, when used on a computer processor controlling a printing operation of a digital printer having a first electromagnetic wavelength absorbing ink and a second ink of the same colour as said first ink that does not absorb significantly at the first electromagnetic absorption wavelength of the first ink, causes a printer controlled by the processor to print a machine-readable pattern using the first ink and a human discernable content that is superposed with said pattern using the second ink and not the first ink.

54. A method of printing a document printed with both (i) a machine-readable position-determining pattern printed in a machine-readable ink that absorbs or reflects at a non-visible wavelength significantly differently from the substrate upon which it is printed, and (ii) human-discernable content printed with human-discernable ink that is not said machine-readable ink, the method comprising having a digital printer having a first ink channel provided with said machine-discernable ink and a second ink channel provided using pattern data of a digital representation of the document to control the printing of pattern using the second ink channel, and using content data of the digital representation to control the printing of the content using the first channel.

55. The use of a subset of inks of an ink set provided in a digital printer to print machine-readable position-determining pattern on a document, and the use of a different subset of inks of said ink set to print human-

discernable content in said document, where said content is superposed with said pattern and the use of a third subset of inks of said ink set to produce content on documents which do not have pattern or on areas of said document which do not overlay pattern.

5

56. The use of a subset of inks of an ink set provided in a digital printer according to claim 55, further including the use of two different look-up tables in determining the amount of at least one specific colour ink of an ink set to be used in printing a particular colour, depending upon whether a document to be printed, or an area of a document to be printed with content, has pattern or not.

10

57. A colour separation look-up table for use in a colour separation in digital printing, the look-up table having a concordance between a plurality of colours and for each colour an equivalent level of ink for each ink available in an ink set expected to be available to a printer, and wherein the look-up table has a first colour for which a specific ink colour channel is to be used exclusively, not using inks from other ink colour channels, and wherein the look-up table has for other colours, optionally all other colours, equivalent combinations of levels of ink from said other ink colour channels, no ink of said specific ink colour channel being associated with said other colours.

15

20

58. A pair of colour separation look-up tables for use in colour separation in digital printing, the pair of look-up tables comprising a first look-up table having a concordance between a plurality of desired colours and levels of inks to be used to print those colours using inks from a first set of inks expected to be present in a digital printer; the first look-up table including an amount of a specific ink from a specific ink colour channel in the combination of inks used to print a range of colours; and a second look-up table having a concordance between said plurality of desired colours and

25

30

levels of inks to be used in combination to print those colours, said specific ink being associated by said second look-up table with a specific single ink colour channel exclusively and not being included in the combination of inks to be used to print at least some other colours, optionally not in the combination used for any of said other colours, the levels of inks used in a combination of inks to print a particular colour being different for the combination used for at least some colours to be printed between (i) the levels specified by the first look-up table and (ii) the levels specified by the second look-up table in order to compensate for the absence of said specific ink in the compositions of the second look-up table.

59. A computer-readable memory encoded with the look-up table of claim 57, or the pair of look-up tables of claim 58.

60. A printer driver or print controller adapted to select from said memory one of the first and second look-up tables of claim 60 as it depends from claim 58.

61. A colour separation unit for a printer comprising two colour separation look-up tables: a first to be used when a document having machine-readable pattern is to be printed or for areas of a document which are superposed with pattern, and a second, different, look-up table to be used when a document having no pattern is printed, or for areas of a document that have no pattern.

62. A colour separation unit according to claim 61 comprising a selector adapted to determine whether a document, or area of a document, is to contain pattern or not and to select the appropriate look-up table for use in colour separation.

63. A method of using a printer to print a document having machine-readable pattern and human-discernable content comprising using a colour separation process to print pattern using an ink that is not used to print any of the content either (i) at all, or (ii) at least in the areas of the document
5 where the content and pattern are superposed one on the other.

64. A method of using a printer according to claim 63 to print both documents that have both machine-readable pattern and human-discernable content, and documents that have at least regions with no pattern,
10 comprising using two different colour separation look-up tables in a colour separation process: a first arranged to use one ink exclusively to print pattern and not to use that ink for content, and a second arranged to use said one ink in at least some content.

15 65. A sheet of paper having content and position-determining pattern printed upon it, the pattern being printed in an ink which absorbs radiation at a particular wavelength and being of a particular colour, and content that is superposed with said pattern being printed with an ink that is of substantially said particular colour and which does not absorb at said
20 particular wavelength.

66. A sheet of paper having content and position-determining pattern printed upon it, the pattern being printed with ink that absorbs radiation at a particular wavelength, and pattern superposed with first said content
25 being printed in an ink or inks which do not absorb at said wavelength, second said content being printed on said sheet in an area or areas that do not superpose pattern and being printed with an ink or inks which absorb at said wavelength.

30 67. Software adapted to choose a correct colour separation dataset from a plurality of colour separation datasets available for graphical objects

which will be printed in areas that will also have content, and to select another dataset for graphical objects that will not be superposed with content.

5 68. Use of a printer having two black inks: a first that absorbs infra-red radiation and a second that does not, to print a position-determining pattern using the infra-red absorbing black ink and to print content superposed upon said pattern using said non-infra-red absorbing black ink.

10 69. An ink cartridge or ink set for a digital printer, the ink set or cartridge having two black inks: a first black ink which absorbs infra-red radiation at a specific wavelength for printing a position-determining pattern, and a second black ink which does not significantly absorb at said wavelength for printing content superposed with said pattern.

15

70. A print control system adapted to control a printer having a machine-readable ink, said control system allocating said machine-readable ink to a pattern-allocated colour channel of said printer and being configured to cause said printer to print documents having both (i)
20 machine-readable pattern adapted to enable a reading pen to determine its position in the pattern, and (ii) human-discernable content that is not read by said pen, the control system being configured to cause the printer to print pattern from said pattern-allocated colour channel and to use said pattern-allocated colour channel exclusively for printing pattern when
25 printing a document having both pattern and content, and to print content exclusively using inks that are not from said pattern allocated channel when printing documents that have both content and pattern.

71. A control system according to claim 70 which is configured to
30 control said printer to print content of documents which do not have pattern using ink from said pattern-allocated channel.

72. A control system according to claim 70 or claim 71, wherein a first look-up table is provided to enable a conversion of pixel colour values from RGB to separate ink colour values in a colour separation process, and
5 wherein the first look-up table is adapted to translate RGB colour data input for content into colour planes that do not include the colour plane of the machine-readable ink.

73. A control system according to claim 72 wherein said first look up
10 table is adapted to translate pattern data into a single colour plane that is allocated to said pattern-allocated colour channel.

74. A control system according to claim 72 or claim 73 wherein the system has a second look-up table which is adapted to enable a conversion
15 of pixel colours from RGB to separate ink colour values in a colour separation process, and wherein the second look-up table is adapted to translate RGB colour data input for content into colour planes that do include a colour plane having the colour plane of the machine-readable ink, the control system being arranged to use the first look-up table when
20 controlling the printing of documents, or regions of documents, which have both content and pattern and to use the second look-up table when controlling the printing of documents, or regions of documents, which have content but no pattern.

25 75. A control system according to claim 74 wherein for a printer having CMY inks the relative amounts of C ink, M ink, and Y ink determined by the look up tables, to be used for at least some RGB colours are different, for the same RGB colour, in the first and second look-up tables.

30 76. A control system according to any one of claims 70 to 75 which is adapted to control a printer having CMYK inks, the K ink comprising said

machine-readable ink, and wherein said system, when controlling the printing of documents having both content and pattern, is adapted to cause black colour in content which is superposed with pattern to be printed using CMY ink channels, and pattern to be printed using a K ink channel, and which, when controlling the printing of a document that does not have pattern, or when controlling the printing of content in areas of a document which does not have pattern, is adapted to use the K channel to print black and/or in ink compositions to create secondary colours for the printing of content.

10

77. A control system according to any one of claims 70 to 76 adapted for use with a printer having a first black ink, K1, in a first printer colour channel, and a second black ink, K2, in a second printer colour channel, K2 comprising said machine-readable ink and the second colour channel comprising said pattern-allocated channel, and K1 comprising a black ink that is not readable by said pen; said system being adapted when controlling printing of a document having both content and pattern to cause the printer to print at least content superposed upon pattern using K1 and not K2, and to print pattern using K2.

20

78. A control system according to claim 77 adapted when controlling printing of a document having no pattern, or areas of a document having no pattern, to control the printer to print the content using K2 instead of, or as well as, K1.

25

79. A control system according to any preceding control system claim adapted for use with a printer having at least five colour channels comprising K1, K2, C, M and Y.

30

80. A control system according to any one of claims 70 to 79 adapted to route data representative of content colour to (i) a colour separation

process, and to (ii) a half-toning process, and to (iii) a masking process, and where said system is adapted to route data representative of pattern so as to by-pass a half-toning process.

5 81. A control system according to claim 80 adapted to route data representative of pattern so as to by-pass a masking process.

82. A control system according to claim 80 or claim 81 adapted to route
data representative of content through a linearisation process, and adapted
10 to route data representation of pattern so as to by-pass said linearisation
process.

15

20